BIRM FILTER WITH AIR INJECTION ASM
and high-flow 1" valve

MODEL
NS AIIF-110

Installation • • Operation • • Maintenance

• • Repair Parts • •

ECODYNE WATER CONDITIONING, PO BOX 64420, ST. PAUL, MN 55164 - 0420 Part No. 7273696 (Rev. G 4/24/07)

WATER FILTER WARRANTY

Warrantor: North Star Water Conditioning, 1890 Woodlane Drive, Woodbury, MN, 55125

Warrantor guarantees, to the original owner, that:

One Year Full Warranty:

For a period of one (1) year after installation, all parts will be free of defects in materials and workmanship, and will perform their normal functions.

For a period of one (1) year after installation, labor to repair or replace any part deemed to be defective in materials and workmanship, will be provided at no additional cost.

Limited Warranties:

Limited ten (10) year warranty, from date of purchase, the salt tank and fiberglass mineral tank will not rust, corrode, leak, burst, or in any other manner, fail to perform their proper functions.

Limited three (3) year warranty, after installation, the electronic control board will be free of defects in materials and workmanship, and will perform their normal functions.

If, during such respective period, a part proves to be defective, Warrantor will ship a replacement part, directly to your home, without charge. After the first year, labor necessary to maintain this product is not covered by the product warranty.

General Conditions

Damage to any part of this water filter because of misuse, misapplication, neglect, alteration, accident, installation or operation contrary to our printed instructions, or damage caused by any unusual force of nature such as, but not limited to, freezing, flood, hurricane, tornado, or earthquake is not covered by this warranty. In all such cases, regular parts and service charges will apply.

We assume no warranty liability in connection with this water filter other than specified herein. This warranty is in lieu of all other warranties, expressed or implied, including warranties of fitness for a particular purpose. We do not authorize any person or representative to assume for us any other obligations on the sale of this water filter.

Should a defect or malfunction occur, contact your contractor. If you are unable to contact your contractor, return the part, freight prepaid, directly to the factory at the address below. Enclose with the part a full description of the problem, with your name, full address, date purchased, model and serial numbers, and selling contractor's name and address. We will repair or replace the part and return it to you at no cost if our repair department determines it to be defective under the terms of the warranty.

This warranty gives you specific legal rights and you may have other rights which vary from state to state.

This water filter is manufactured by North Star Water Conditioning, PO Box 64310, St.Paul, MN 55164-4310; customer information telephone no. 1-800-972-0135.

SAFETY GUIDES

Follow the installation instructions carefully. Failure to install the filter properly **voids the warranty.**

Before you begin installation, read this entire manual. Then obtain all the materials and tools you will need to make the installation.

Check local plumbing and electrical codes. The installation must conform to them.

NOTE: Codes in the state of Massachusetts require installation by a licensed plumber. For installation, use plumbing code 248–CMR of the Commonwealth of Massachusetts.

Use only lead–free solder and flux for all sweat-solder connections as required by state and federal codes.

Use care when handling the filter. Do not turn upside down, drop, or set on sharp protrusions.

Do not locate the filter where freezing temperatures occur. Do not attempt to filter water over 120°F. **Freezing, or hot water damage voids the warranty.**

Avoid installing in direct sunlight. Excessive sun heat may cause distortion or other damage to non–metallic parts.

The filter requires a **minimum water flow of 5 gallons per minute** at the inlet for *backwash*.

Recommended maximum allowable inlet water pressure is 60 psi. Use a pressure reducing valve if necessary. Be sure the addition of a pressure reducing valve will not reduce the flow to less than the 5 gpm needed for backwash.

This filter controller works on 24 volt–60 hz electrical power only. Be sure to use the included transformer, and plug it into a nominal 120V 60 cycle household outlet that is grounded and properly protected by an over–current device such as circuit breaker or fuse. The air pump must be plugged into a separate 115v grounded household outlet.

This system is not intended to be used for treating water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

European Directive 2002/96/EC requires all electrical and electronic equipment to be disposed of according to Waste Electrical and Electronic Equipment (WEEE) requirements. This directive or similar laws are in place nationally and can vary from region to region. Please refer to your state and local laws for proper disposal of this equipment.

UNPACKING

The Air Injected Iron Filters are shipped from the factory in four master cartons consisting of ...

...Mineral tank and adaptor assembly
...Controller assembly (includes this manual)
...Birm packed ◆
...Quartz packed

Thoroughly check the filter for possible shipping damage and parts loss. Also inspect and note any damage to the shipping cartons. Notify the transportation company if damage is present. The manufacturer is not responsible for in–transit damages.

Remove and discard (RECYCLE) all packing materials. Filter assembly instructions are on pages 6 & 5.

◆ **Note:** The birm will initially retain large amounts of air. If it is backwashed before the air is removed, the valve may get plugged with birm particles, or particles may get flushed to the drain.

To remove the air, soak the birm in water for 24 hours prior to loading into the tank, or load the dry birm into the tank, but do not allow the filter to regenerate until the birm has been wetted for at least 24 hours.

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SPECIFICATIONS / DIMENSIONS

Filter Type . . . . . *Oxidizing*
Type of Mineral . . . . . *Birm*
Amount of Mineral . . . . . *1 cu ft*
Amount of Gravel . . . . . *17 lbs*
Recommended **Maximum** Water Supply Pressure . . . . . *60 psi*
Recommended Type Water Supply . . . . . *Well System*
Maximum Water Temperature . *120 ° F*
Minimum Water Supply pH . . . *7.0*
Maximum Service Flow . . . . . ***5.0 gpm***
Minimum Backwash Flow ① . . ***5.0 gpm***
Minimum In-Out Pipe Size . . . *3/4 in.*
Electrical: Filter Timer *24V-60Hz*
Air Pump *115V-60Hz*

Some feed water with high iron concentrations, or low pH may require limited service flows or a neutralizer filter before the system.

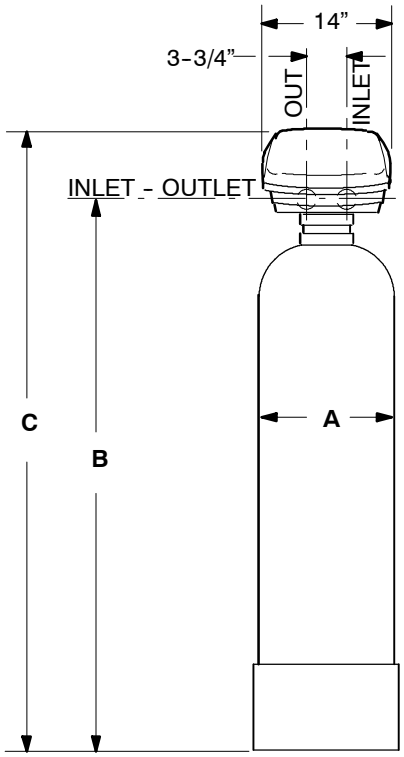
IRON CONC.	TABLE 1			
20 PPM	4*	4*	4*	4
15 PPM	4*	4*	4*	5
10 PPM	4*	4*	4	6
5 PPM	4*	4*	5	7
2 PPM	4*	4	6	8
pH	6.5	7.0	7.5	8.0
* Neutralizer needed				

Contaminant Removal Limitations:

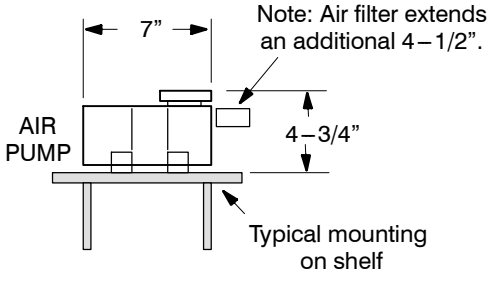
☞ up to 10 ppm iron* and 3ppm hydrogen sulfide at pH of 7.0 and higher
☞ up to 20 ppm iron* and 2ppm hydrogen sulfide at pH of 8.0 and higher
☞ up to 2 ppm manganese at pH of 8.5 and higher

* *except*, bacterial and organically bound iron

① **A minimum flow of 5 gpm is required for filter backwash.**



A	9-1/8”
B	63–3/4”
C	72–1/2”
Nominal Mineral Tank Size	9” dia. by 60” high



FILL THE MINERAL TANK

1. Remove the adaptor assembly from the mineral tank.

2. Fill the tank with the gravel and birm, in that order. **Be sure the bottom distributor is centered in the tank. Do not get gravel and birm inside the distributor.** Do not overfill tank. See recommended freeboard range, page 6.

> **NOTE:** The birm will initially retain large amounts of air. If it is backwashed before the air is removed, the valve may get plugged with birm particles, or particles may get flushed to the drain.

To remove the air, soak the birm in water for 24 hours prior to loading into the tank, or load the dry birm into the tank, but do not allow the filter to regenerate until the birm has been wetted for at least 24 hours.

INSTALL ADAPTOR ON MINERAL TANK

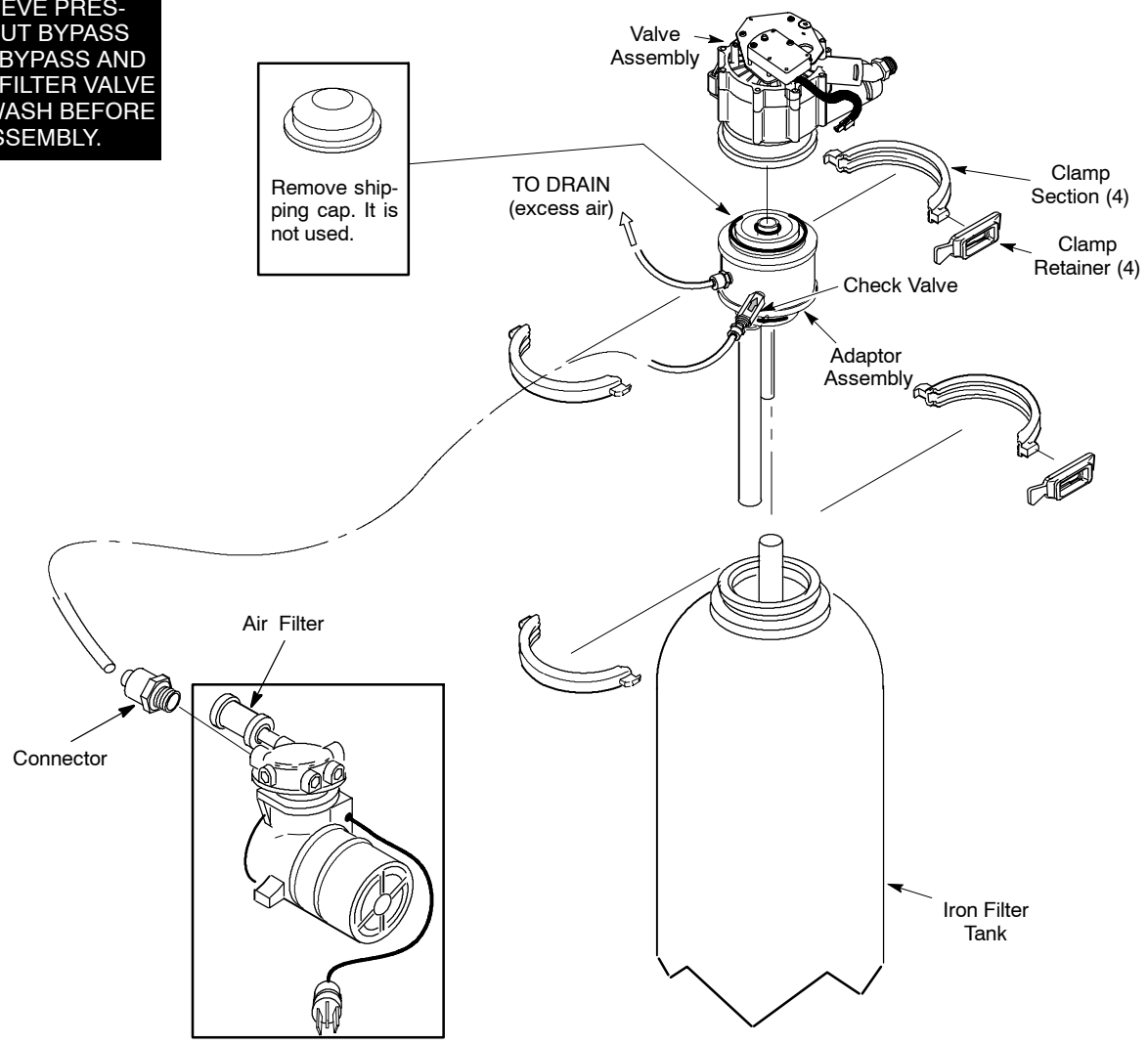
1. Be sure o–ring seals are lubricated and installed in place on the adaptor.

2. Be sure the tank opening is clean. Then, install the tank adaptor as shown in Figure 1. Use clamps and retainers to fasten in place.

3. Install the valve assembly, clamping in place.

WARNING: FILTER TANK CONTAINS AIR. TO RELIEVE PRESSURE, PUT BYPASS VALVE IN BYPASS AND ADVANCE FILTER VALVE TO BACKWASH BEFORE DISASSEMBLY.

FIGURE 1



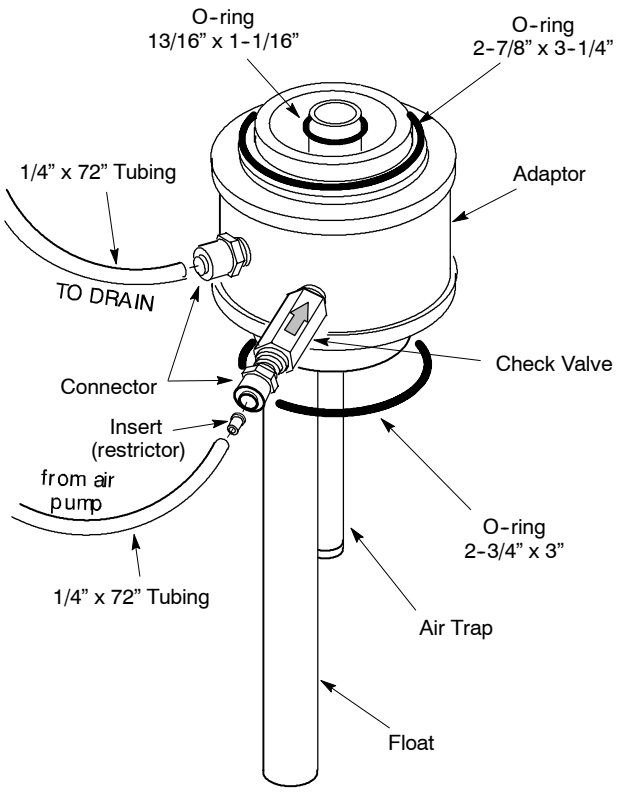
ASSEMBLE AIR INJECTOR ADAPTOR

1. Take a length of 1/4" tubing and push the insert (restrictor) into one end. Then, push this end of the tubing into the long, check valve arrow marked connector fitting installed in the check valve.

2. Take the other length of tubing and push one end into the other connector fitting on the adaptor.

FIGURE 2

AIR INJECTOR ADAPTOR ASSEMBLY



SANITIZING THE FILTER

Care is taken at the factory to keep your water filter clean and sanitary. Materials used to make the filter will not infect or contaminate your water supply, and will not cause bacteria to form or grow; however, during shipping, storage, installing and operating, bacteria could get into the filter. For this reason, sanitizing, as follows, is suggested when installing.

Pour about 1 oz. or 2 oz. of the following disinfectant into the filter.

1. Calcium hypochlorite, available in granular or tablet form, under trade names such as Perchloron or HTH.

2. Common 5.25% household bleach such as Clorox, Linco, Bo Peep, White Sail, Eagle, etc.

SANITIZING CONTINUED IN STEP 9, PAGE 10.

Freeboard is the distance from the top of the tank, down to the top of the mineral bed.

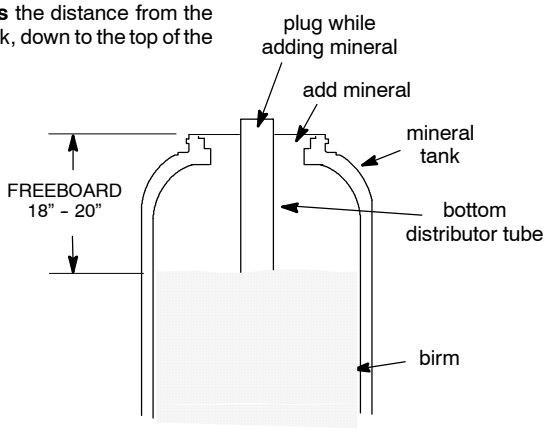
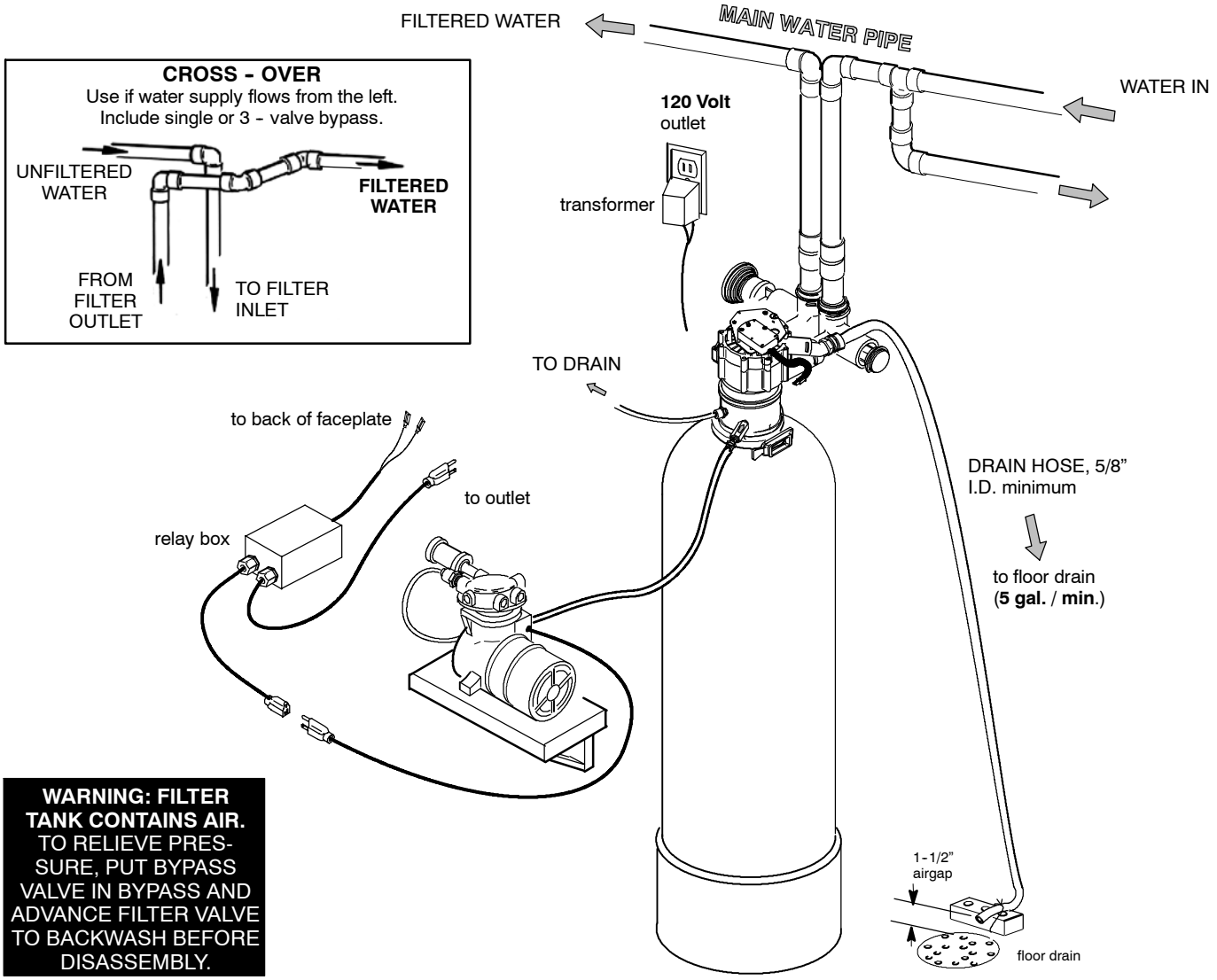


FIGURE 3

TYPICAL FINISHED INSTALLATION


FILTERED WATER
MAIN WATER PIPE
WATER IN
CROSS - OVER
Use if water supply flows from the left.
Include single or 3 - valve bypass.
UNFILTERED WATER
FILTERED WATER
FROM FILTER OUTLET
TO FILTER INLET
120 Volt outlet
transformer
TO DRAIN
to back of faceplate
to outlet
relay box
DRAIN HOSE, 5/8" I.D. minimum
to floor drain (5 gal. / min.)
1-1/2" airgap
floor drain
WARNING: FILTER TANK CONTAINS AIR. TO RELIEVE PRESSURE, PUT BYPASS VALVE IN BYPASS AND ADVANCE FILTER VALVE TO BACKWASH BEFORE DISASSEMBLY.

▶ INLET - OUTLET PLUMBING OPTIONS

1. ALWAYS INSTALL either a single bypass valve, #7214383, or a 3 valve bypass system.

2. Use 1"... or, 3/4" (minimum) pipe and fittings.

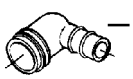
3. Use sweat copper... or, threaded pipe*... or, PVC plastic pipe.*

*Sweat soldering is required to adapt to the fittings (1" male) supplied with the filter, or obtain approved compression adaptors. The following special fittings are available from Ecodyne. **Be sure to comply with all local plumbing codes.**

OPTIONAL INLET/OUTLET FITTINGS

— #7104546 PVC Nipple – Use in place of included copper inlet and outlet tubes.

— #7129211 Adaptor Fitting, 1–1/2" (2) – Use in place of included copper inlet and outlet tubes.

 — #7120259 Elbow – Extends inlet and/or outlet in any 90˚ direction.

▶ OTHER REQUIREMENTS

4. A drain is needed for regeneration discharge water. A floor drain, close to the filter is preferred. A laundry tub, standpipe, etc., are other options.

CAUTION: Drain water exits the hose at a fast flow rate, and at water system pressure. Be sure the hose is fastened in some manner to prevent "whipping" and splashing to prevent water damage to surrounding area.

5. A 120v–60Hz, grounded electrical outlet (continuously "live") is needed within 10' of the filter.

▶ TOOLS YOU MAY NEED

- tape measure
- pliers
- tubing cutter
- pipe joint compound*
- LEAD-FREE solder and flux
- common screwdriver
- adjustable wrench
- propane torch
- primer
- cross-point screwdriver
- hacksaw
- emery cloth, sandpaper or steel wool
- solvent cement*

▶ MATERIALS YOU WILL NEED

- bypass valve, or 3 valves
- pipe and fittings as required
- 5/8" I. D. minimum drain hose, either standard garden hose, or hose onto a barb fitting*

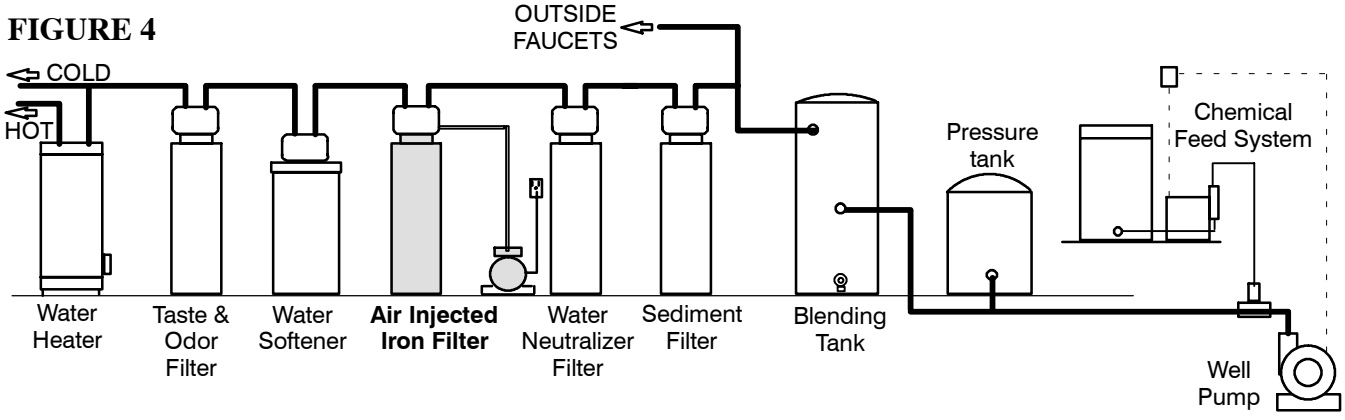
***VALVE DRAIN OPTIONS:** Flexible drain hose is not allowed in all localities (check your codes). For a rigid valve drain run, plumb according to local codes. To connect to the valve drain fitting, purchase an adaptor, garden hose thread x 5/8" (minimum) tube.

▶ SELECT INSTALLATION LOCATION

Consider all of the following when selecting an installation location for the filter selected.

- To filter all water in the home, install the filter close to the water supply inlet. To conserve filtered water, outside faucets should remain on raw water.
- If other water conditioning equipment is installed, locate as shown in Figure 4.
- A nearby drain is needed to carry away regeneration discharge water. A floor drain is preferred, with a laundry tub, standpipe, etc., as other options (check your local codes).
- The filter works on 24 volts only. A transformer is included (FOR INDOOR USE) to reduce 120V–60 Hz house electrical power. Provide an approved, grounded outlet within 10' of the filter. The filter includes a 10' power cable for connection between the transformer and the timer.
- Position the filter at least 6" from surrounding walls, or other appliances, to allow access for servicing.
- If installing the filter in an outside location, be sure to provide protection from the elements, contamination, vandalism, and sunlight heat. The sun's heat can melt plastic parts.

FIGURE 4



INSTALLATION STEPS

1. INSTALL INLET AND OUTLET FITTINGS

NOTE: All fittings are in the small parts bag.

a. Insert the turbine support, into the valve outlet port, up to the shoulder.

NOTE: If installing a single bypass valve, see separate instructions included with it.

b. Slide a lubricated o–ring onto one of the copper tubes. Carefully insert the copper tube into the outlet port, Figure 5, and secure in place with a plastic "C" clip.

NOTE: For lubrication, use silicone grease approved for use on potable water supplies.

c. Repeat step b on the inlet side.

2. TURN OFF WATER SUPPLY

a. Close the main water supply valve, near well pump or water meter.

b. Shut off the electricity or fuel supply to the water heater.

c. Open high and low faucets to drain all water from hose pipes.

3. INSTALLING 3–VALVE BYPASS

If installing a 3–valve bypass system, plumb as needed. If installing sweat copper, be sure to USE LEAD–FREE SOLDER as required by Federal and State codes. Use pipe joint compound on outside pipe threads.

4. MOVE FILTER INTO PLACE

Move the filter into the installation position, setting on a solid, smooth and level surface. If needed, place the filter on a section of 3/4" plywood. Then shim under the plywood to level the filter, Figure 6.

CAUTION: DO NOT PLACE SHIMS DIRECTLY UNDER THE FILTER. The weight of the tank may cause the tank base to fracture at the shim.

5. ASSEMBLE INLET AND OUTLET PLUMBING

Measure, cut and loosely assemble pipe and fittings from the main water pipe, or from bypass valves installed in step 3, to the filter inlet and outlet copper tubes.

BE SURE UNFILTERED WATER SUPPLY PIPE GOES TO THE FILTER INLET SIDE. Trace the water flow direction to be sure.

FIGURE 5

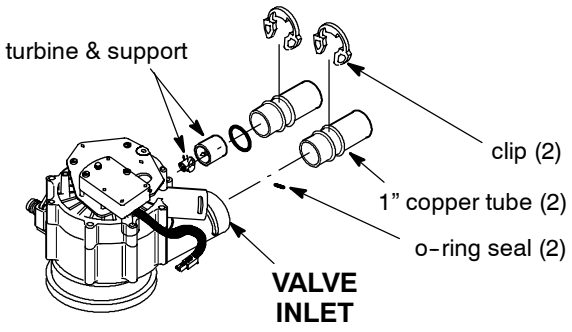
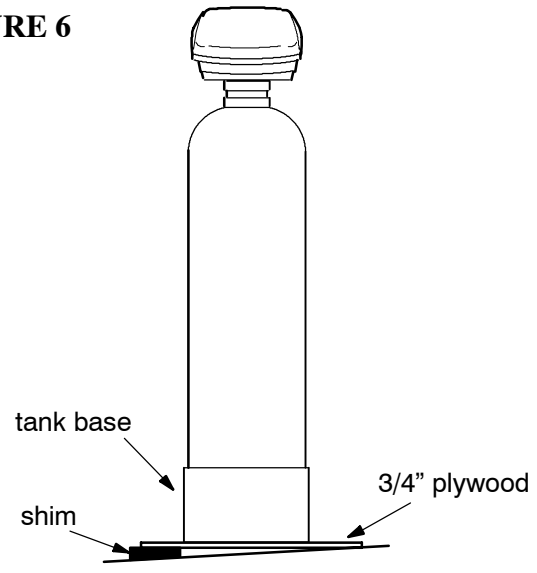


FIGURE 6



6. CONNECT INLET AND OUTLET PLUMBING

Complete the inlet and outlet plumbing as applicable.

a. SOLDERED COPPER

(1) Thoroughly clean and flux all joints.

(2) Remove the inlet and outlet tubes from the valve (pull plastic "C" clips), and o-rings from the tubes. DO NOT SOLDER WITH TUBES IN THE VALVE. SOLDERING HEAT WILL DAMAGE THE VALVE.

(3) Make all solder connections. Be sure to keep fittings fully together, and pipes square and straight.

(4) AFTER PLUMBING HAS COOLED, repeat steps 1b and 1c.

b. THREADED PIPE

(1) Apply pipe joint compound to all outside pipe threads.

(2) Tighten all threaded joints.

(3) If SOLDERING TO INLET AND OUTLET TUBES, observe steps (1) through (4) above.

c. CPVC PLASTIC PIPE

(1) Clean, prime and cement all joints (follow instructions of the plastic pipe and fittings manufacturer).

(2) IF SOLDERING TO INLET AND OUTLET TUBES, observe preceding steps (1) through (4).

7. COLD WATER PIPE GROUNDING

The house cold water pipe (metal only) is often used as a ground for the house electrical system. The 3–valve bypass type, if installed, will maintain ground continuity. If you use the plastic bypass valve at the filter, continuity is broken. To restore the ground, install one of the following grounds.

a. Use the included ground clamp to jumper across the inlet and outlet copper tubes Figure 7a.

b. Install a #4 copper wire across the removed section of main water pipe, securely clamping on both ends, Figure 7b.

8. INSTALL VALVE DRAIN HOSE

a. Connect a length of 5/8" I.D. (minimum) hose to the valve drain elbow on the controller Figure 3. The elbow accepts either a hose onto the barb fitting, or standard garden hose onto the threads.

NOTE: Flexible drain hose is not allowed in all localities. See option on page 8.

b. Run the hose to a floor drain, and as typically shown in Figure 3, tie or wire the end to a brick or other heavy object. This will prevent "whipping" during regenerations. Be sure to provide a 1–1/2" minimum air gap, to prevent possible sewer water backup.

NOTE: In place of a floor drain, you can use a laundry tub or stand pipe as a good drain point for this hose. Avoid long drain hose runs, or elevating the hose.

FIGURE 7

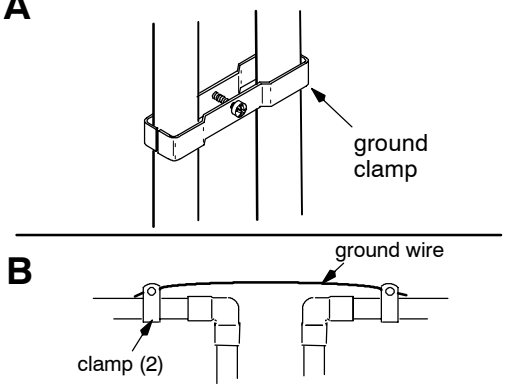
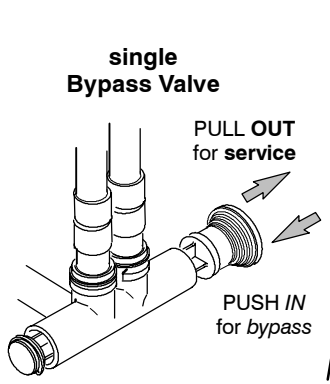
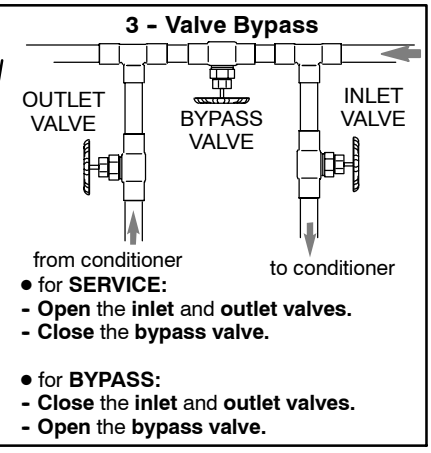


FIGURE 8





9. PRESSURE TESTING FOR LEAKS

TO PREVENT EXCESSIVE AIR PRESSURE IN THE FILTER AND PLUMBING SYSTEM, DO THE FOLLOWING STEPS IN ORDER.

a. Open two or more filtered water faucets, both hot and cold.

b. Referring to Figure 8, turn the bypass valves to service position.

c. Slowly open the main water supply valve.

d. Close the filtered water faucets after both of the following occur.
– water runs smoothly, with no air bubbles
– you can smell the sanitizing bleach odor at the faucets, page 6

e. Check your complete installation for leaks. If rework is required, be sure to observe precautions in step 7.

10. CONNECT ALL LEADWIRES

a. Connect the wire harness to the valve position switch Figure 9 and to the back of the timer. Snap the sensor onto the out port of the valve. The switch is on the outlet side, under the motor plate.

NOTE: Check to be sure the connector is secure on the back of the timer.

b. Attach the connector on the valve motor leadwire, to the matching connector on the faceplate timer.

c. Connect the power cable leads to the back of the timer.

d. Connect the leads from the relay box to the back of the timer. Secure the wire using the strain relief and attaching it to the valve.

11. CONNECT AIR PUMP

a. Fasten the air pump in place on the floor or a shelf nearby the filter.

b. Install the air filter (if required) and tubing connector fitting.

c. Connect the tubing from the check valve on the adaptor to the connector fitting on the air pump.

d. Plug the pump into the relay box connector.

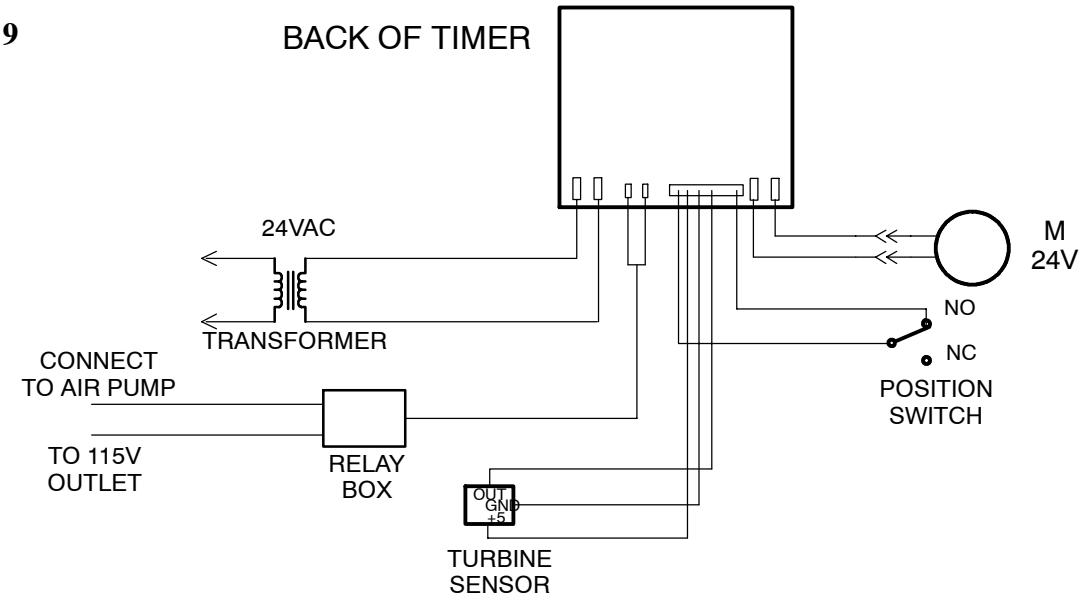
12. CONNECT TO ELECTRICAL POWER

Plug the transformer into a continuously “live”, grounded, 115V–60Hz house electrical outlet, approved by local codes.

13. To complete the installation, do the programming steps on pages 12 and 13.

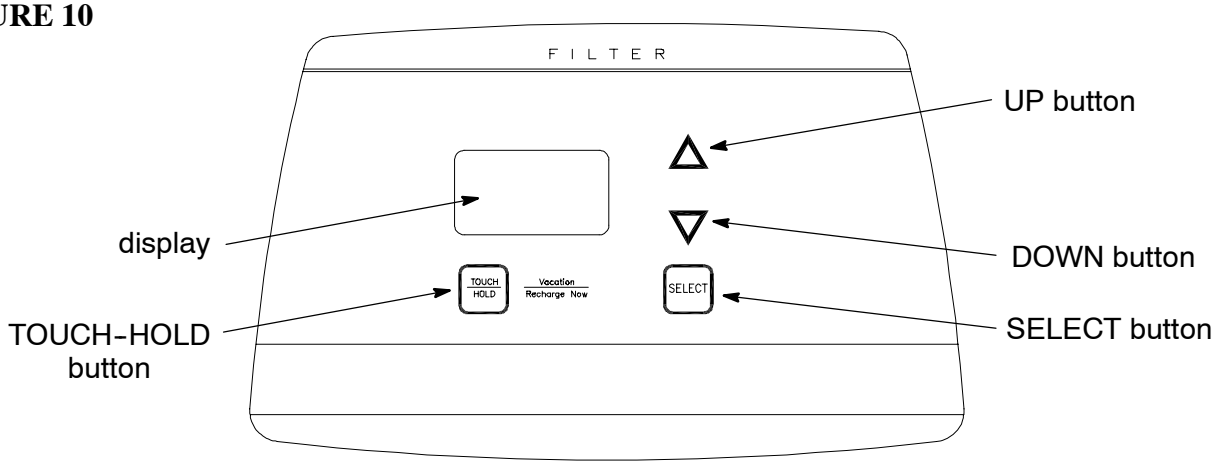
NOTE: See water heater start–up on page 13.

FIGURE 9



PROGRAMMING THE FACEPLATE TIMER

FIGURE 10



▶ **TIMER SETTINGS REQUIRED,** upon installation, and after an extended power outage, see Power Outage Memory, page 14.

When the transformer is plugged into the electrical outlet, the model code and a test number (example: J1.0), begins to flash in the faceplate display. Then, 12:00 PM and PRESENT TIME begins to flash. Program the timer as follows.

▶ *SET PRESENT TIME OF DAY*

If the words *PRESENT TIME* do not show in the display, press the SELECT button until they do.

Press the △ UP or ▽ DOWN buttons to set the present time. Up moves the display ahead; down moves the time backward. Be sure AM or PM, is correct.

Press buttons and quickly release to slowly advance the display. Hold for fast advance. This procedure applies for all following settings.

Press the SELECT button to set present time and advance to the next set up screen.

▶ *SET DAYS TO RECHARGE*

The default setting is 3 days. This means the filter will recharge every 3 days. If a change is needed, use the △ UP or ▽ DOWN buttons to set from 1 to 99 days between recharges.

PROGRAMMING THE FACEPLATE TIMER

SUGGESTED REGENERATION DAYS

The filter must recharge to clean iron out of the filtering mineral. How often regeneration, or recharge, is needed depends on two things.

1. The parts per million (PPM) of iron in your water supply and;

2. The number of people that live in your house.

To use the table, find the ppm iron in your water supply across the top of the table. Read down this column, and across from the number of people in the household. At the intersecting point, the suggested days to regenerate are shown. Set the regeneration days on the timer.

Number of people in household	Iron (parts per million)			
	1 – 2	3 – 4	5 – 7	8 – 20
1	4 days	3 days	2 days	1 day
2	4 days	3 days	2 days	1 day
3	4 days	3 days	1 day	1 day
4	3 days	2 days	1 day	1 day
5	3 days	2 days	1 day	1 day
6	2 days	1 day	1 day	1 day
7	2 days	1 day	1 day	1 day
NOTE: If the water supply has high turbidity (sand, silt, sediments, etc.), manganese or hydrogen sulfide, set the filter to regenerate more often than the table above shows.				

Press the SELECT button to set and advance to the next set up screen.

▶ *SET RECHARGE TIME*

The default setting is 12:00 AM. This is a good time if you have a water softener or another filter installed, the recharge time should be offset to assure adequate water flow and pressure. For example, set the filter to start backwash at 12:00 AM, or 4:00 AM, if the water softener is set to begin recharge at 2:00 AM.

If a change is needed, use the △ UP or ▽ DOWN buttons to set time.

Press the SELECT button to set and return to the normal run display.

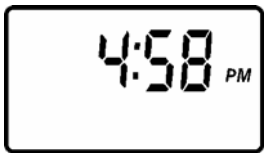
THE INSTALLATION AND PROGRAMMING STEPS ARE COMPLETE

NOTE: After you have completed all preceding instructions, your house water supply is filtered immediately. However, **your water heater is filled with unfiltered water** and, as hot water is used, it will refill with filtered water. When all the water is replaced in the water heater, all water will be filtered. If you want totally filtered water immediately, start an immediate recharge (backwash), see page 14. Once the recharge is over (no water running from filter drain hose), drain the water heater. Drain until the water runs cold. **If you do drain the water heater, *use extreme care as the hot water could cause severe burns.***

FACEPLATE TIMER FEATURES, SETTINGS AND SERVICE

NORMAL OPERATION, TIMER DISPLAYS

During normal operation, the present time of day, and AM or PM, show in the time display area. When a regeneration begins, *RECHARGE NOW* starts



to flash in the display, along with the present time of day. *RECHARGE NOW* flashes until the regeneration is over.

feature: *RECHARGE NOW*

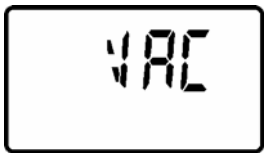
For times you expect to use more water than usual, use the RECHARGE NOW control. Press the Touch–Hold button until *RECHARGE NOW* begins to flash in the time display. A

regeneration begins immediately. The filter begins to filter your water again in about 2 hours.

NOTE: Avoid using HOT water during the regeneration, because the water heater will refill with unfiltered water.

feature: *VACATION CONTROL*

Before going on vacation, or other long absence, press (do not hold in) the Touch–Hold button so *VAC* starts to flash in the display. The timer continues to keep time, but regenerations will not occur and waste water.



When you return, press the Touch–Hold button again to return the filter to service, and the present time in the display. REMEMBER TO DO THIS, or the filter will not regenerate until you do.

NOTE: To shut off the water supply to the filter, use the plumbing bypass valve(s).

feature: *POWER OUTAGE MEMORY*

If electrical power to the timer is interrupted, the "memory" built into timer circuitry keeps **all** settings for 6 hours (minimum) or more. The display is blank and the filter will not regenerate. When electrical power comes on, one of two things will happen.

1. The present time of day will show, meaning the timer memory has kept all time settings.

NOTE: If the filter was regenerating when power was lost, it will now finish the cycle.

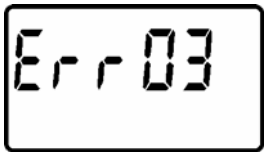
2. The display will show a time, but it will be flashing. The timer memory did **not** keep the time settings and they must be reset (page 12). The display returns to a flashing time, then begins to keep time again. If you do not reset the time of day, the filter will regenerate based on the days to recharge, however, regenerations will most likely be at the wrong time of day.

NOTE: The flashing display is to remind you to reset the timer.

If the filter was regenerating when power was lost, the valve will return to service position without finishing the cycle. Use RECHARGE NOW (see above) to start another cycle if needed.

feature: *ERROR CODES*

An error code could appear in the faceplate display if a problem occurs in the filter. If you see an error code, for example



Err03, instead of the present time of day, please call your local dealer for service, or see your warranty on page NO TAG.

FACEPLATE TIMER FEATURES, SETTINGS AND SERVICE

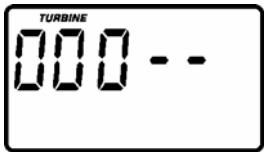
service: *REGENERATION CYCLE TIME ADJUSTMENTS* . . . . . .

The default settings for backwash (25 minutes) and fast rinse (5 minutes) cycles of regeneration are factory set for maximum performance of the filter. Use the following procedures to check for correct cycle times, or to change if desired. However, only trained technicians should change the time settings.

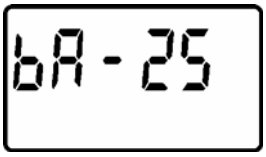
NOTE: Fill and brine times are adjustable, but preset at the factory to zero minutes. It is recommended to leave these settings as preset, unless the filter is used in a custom application by the installer.

service: *ADJUSTABLE BACKWASH TIME* . . . . . .

Press and hold the Select button until the display shows "000––", then press the Select button three times to advance to the Backwash time adjust screen.



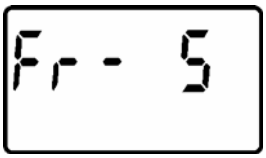
Using the Up or Down buttons adjust the backwash time from 0 minutes to 60 minutes.



service: *ADJUSTABLE FAST RINSE TIME* . . . . . .

Press and hold the Select button until the display shows "000––", then press the Select button four times to advance to the Fast Rinse time adjust screen.

Using the Up or Down buttons adjust the Fast Rinse time from 0 minutes to 60 minutes.



GENERAL INFORMATION

The air injector adaptor installs between the filter valve and mineral tank as shown in Figure 1 (page 5). A pump injects air into the iron filter through the adaptor. The air oxidizes the iron. The oxidized iron is then mechanically filtered by the filter mineral bed. The injector adaptor float allows excess air to vent from the tank.

SERVICE, BACKWASH AND FAST RINSE CYCLES

SERVICE (See Figure 11): Unfiltered water enters the valve inlet port. Internal valve porting routes the water down and out the top distributor, into the mineral tank. The water is filtered as it passes through the mineral bed, then enters the bottom distributor. Filtered water flows back into the valve and out the valve outlet, to the house filtered water pipes.

In time, the filter needs cleaning to remove sediments, dirt, iron, etc., from the mineral bed. This cleaning is done in two stages, or cycles, called backwash and fast rinse. It is started automatically by the timer.

BACKWASH (See Figure 12): The timer starts the valve motor and moves the valve into backwash position. Water is routed down and out the bottom distributor, up through the mineral bed, and out the top distributor to the drain. The fast flow (controlled by a flow plug in the drain fitting) flushes dirt, sediments, iron deposits, etc. to the drain. The mineral bed is lifted and expanded for maximum cleaning.

FAST RINSE (See Figure 13): Valve rotation positions the inner discs so water flow enters the mineral tank through the top, and exits at the bottom, to the drain. The fast flow of water downward, packs the mineral bed and prepares it for return to service.

The timer energizes the valve motor again to return the valve to service.

WATER FLOW PATHS

FIGURE 11

SERVICE CYCLE

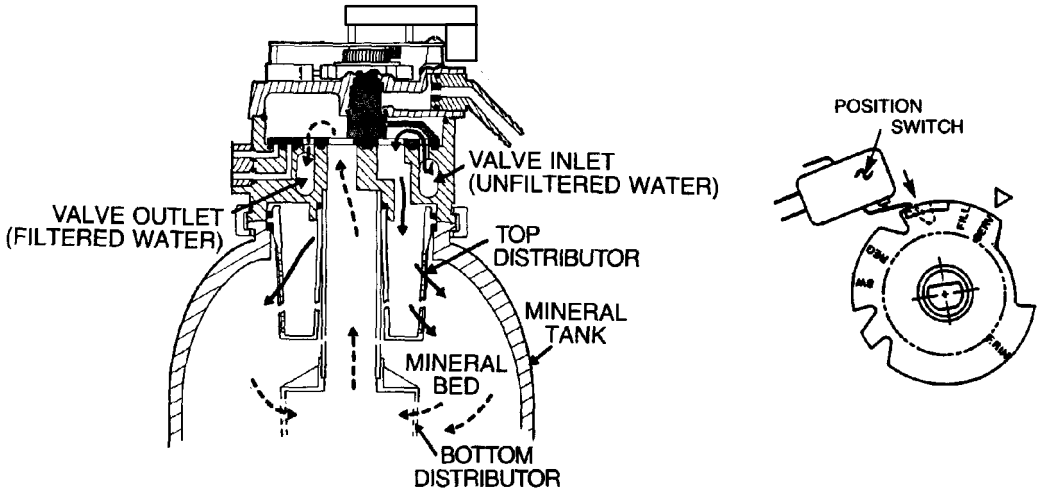


FIGURE 12

BACKWASH CYCLE

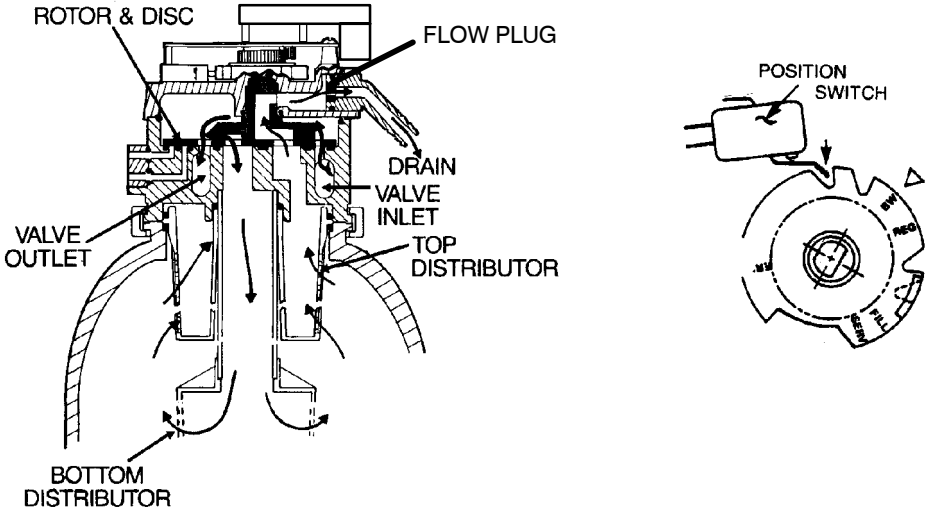
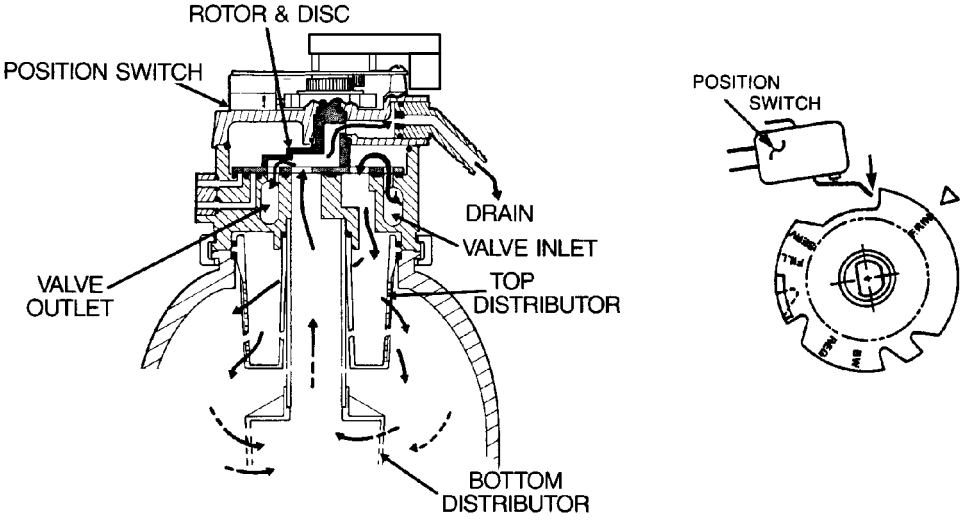


FIGURE 13

FAST RINSE CYCLE



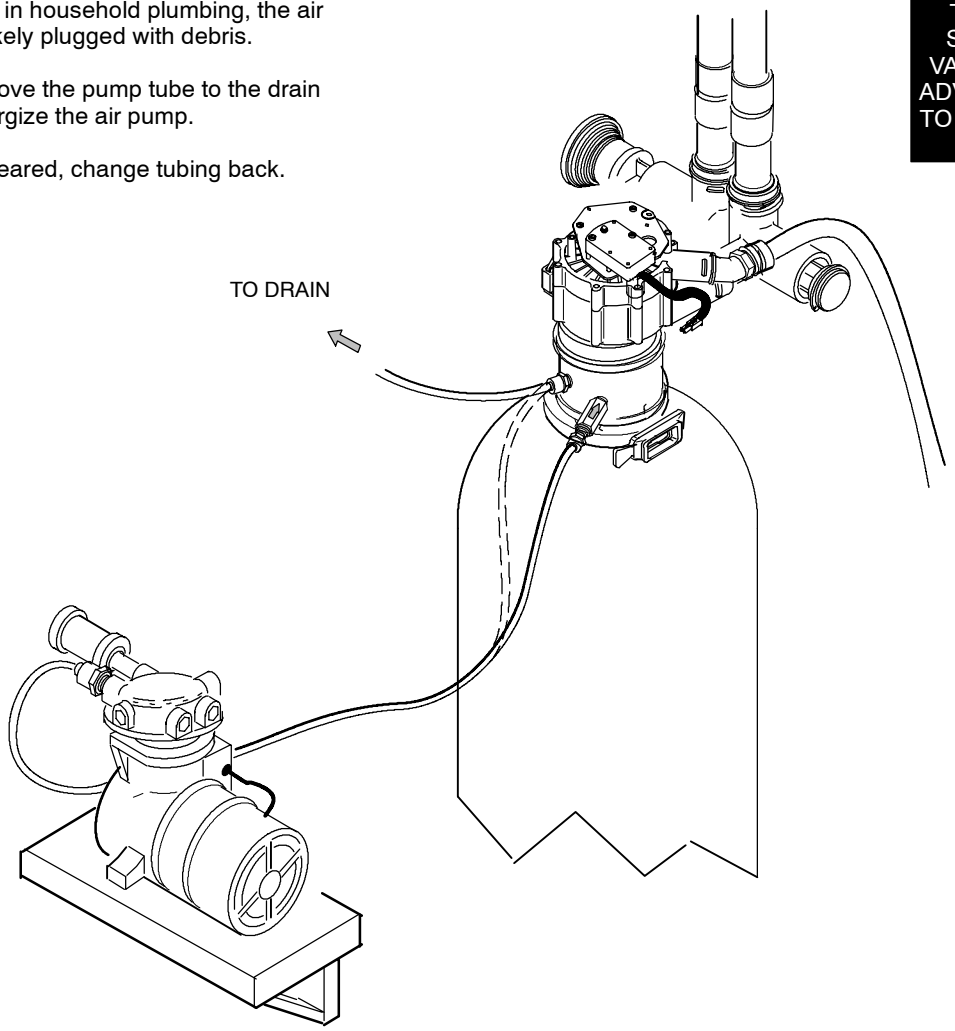
Adaptor Troubleshooting Guide

If excess air is in household plumbing, the air vent is most likely plugged with debris.

Temporarily move the pump tube to the drain fitting and energize the air pump.

After vent is cleared, change tubing back.

WARNING: FILTER TANK CONTAINS AIR. TO RELIEVE PRESSURE, PUT BYPASS VALVE IN BYPASS AND ADVANCE FILTER VALVE TO BACKWASH BEFORE DISASSEMBLY.



TROUBLESHOOTING

ALWAYS MAKE THESE **INITIAL CHECKS** FIRST

1. Does the time display show the correct time of day?

...If display is blank, check power source to the filter.

...If time is flashing, power was off for over 6 hours. The filter resumes normal operation but backwashes occur at the wrong time.

2. Plumbing bypass valve(s) must be in SERVICE position, Figure 7, page 10.

3. The inlet and outlet pipes must connect to the filter inlet and outlet respectively.

4. Is the transformer plugged into a “live” grounded wall outlet?

5. The valve drain hose must be free of kinks and sharp bends.

If you do not find the problem after making the initial checks, do the MANUAL ADVANCE DIAGNOSTICS.

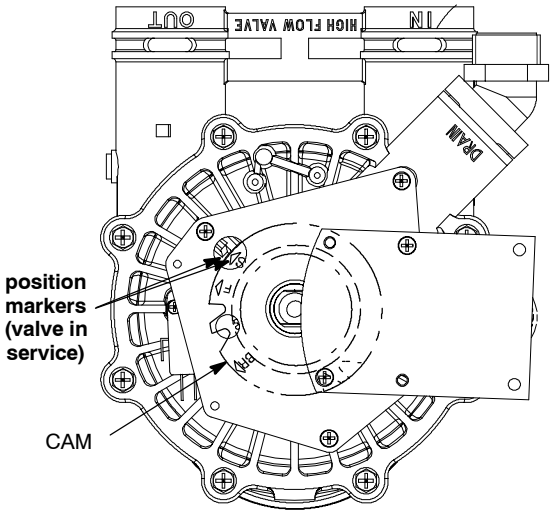
▶ *MANUAL ADVANCE DIAGNOSTICS*

Use the following procedures to advance the filter valve through the regeneration cycles to check operation.

Remove top cover to observe valve rotation.

NOTE: Display must show time and day.

1. Press and hold the Select button until the display shows “000– –”.



2. To advance the valve, press the Touch–Hold button each time you want to move into the next cycle.

➡ Press the Touch–Hold button to move filter into backwash.

a. If it **does not** move into backwash, the valve motor is inoperative. Check all wiring and connections.

➡ Press the Touch–Hold button to move filter into fast rinse. Again look for fast drain flow.

➡ To return filter to service, press the Touch–Hold button.

NOTE: While in manual advance, the time display will automatically return to the present time if a button is not pressed within four minutes.

service: *MANUAL INITIATED ELECTRONICS DIAGNOSTIC* . . . . . .

1. Press and hold the Select button until the display shows "000– –" to enter diagnostics.

The letter (P) and dash(es) indicate POSITION switch operation. The letter appearing means the switch is closed; the dash means the switch is open.

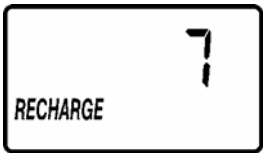
Use the Touch–Hold button to manually advance the valve into each cycle and check correct switch operation.

CORRECT SWITCH DISPLAYS	VALVE CYCLE STATUS
– –	Valve in service, backwash or fast rinse position.
– P	Valve rotating from one position to another.

While in this diagnostic screen, the following information is available and may be beneficial for various reasons. This information is retained by the computer from the first time electrical power is applied to the face plate.

Press the Up button to display the number of days this face plate has had electrical power applied.

Press the Down button to display the number of regenerations initiated by this face plate since the model code number was entered.



2. Press the Select button and hold in 3 seconds until a model code appears in the display.

For correct filter operation, the model code number must be HAIIF.

To reset the code, press the Up or Down button until the correct number shows.

3. Press Select to return the present time display. If the code was changed, make ALL the timer settings, pages 12 and 13.

▶ *OTHER SERVICE*

UNFILTERED WATER BYPASS (unfiltered water "bleeds" into filtered water supply.

1. Defective rotor and disc, seal or wave washer (see pages 22 and 23).

2. Missing or defective o–ring(s) at resin tank to valve connection (see pages 20 and 21).

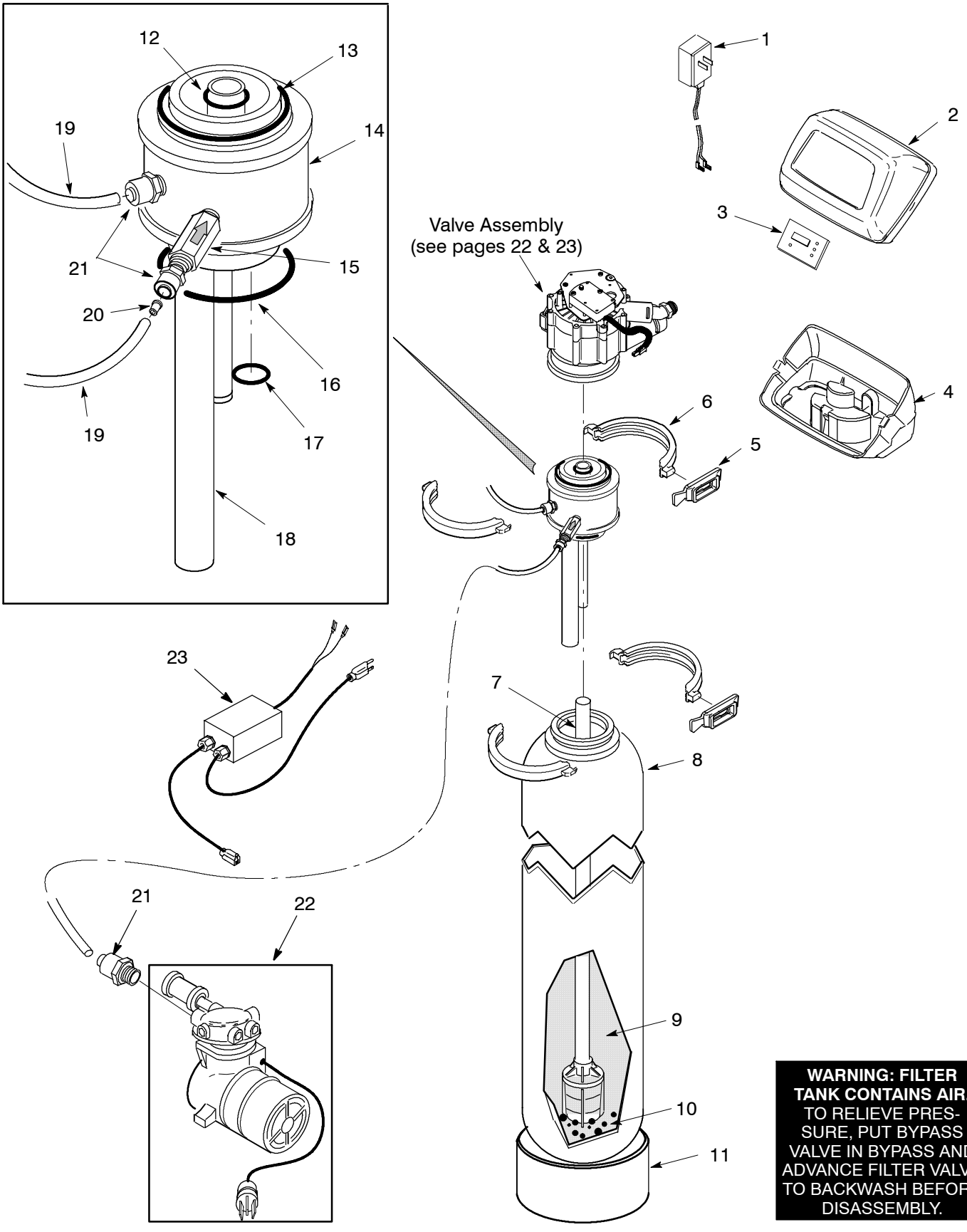
▶ *AUTOMATIC ELECTRONIC DIAGNOSTICS*

The face plate has a self diagnostic function for the electrical systems (except input power). The faceplate monitors the electronic components and circuits for correct operation. If a malfunction occurs, an error code appears in the faceplate display.

CODE	POSSIBLE DEFECT MOST LIKELY ➤---------➤ LEAST LIKELY
Err 01 Err 02 Err 03 Err 04	wiring harness or connection to position switch / switch / valve defect causing high torque / motor inoperative
Err 05	faceplate

PROCEDURE FOR REMOVING ERROR CODE FROM FACEPLATE: 1. Unplug transformer---- 2. Correct defect---- 3. Plug in transformer---- 4. Wait for 6 minutes. The error code will return if the defect was not corrected. Press and hold the TOUCH-HOLD button for 3 seconds as an alternate way to clear an error code.

REPAIR PARTS



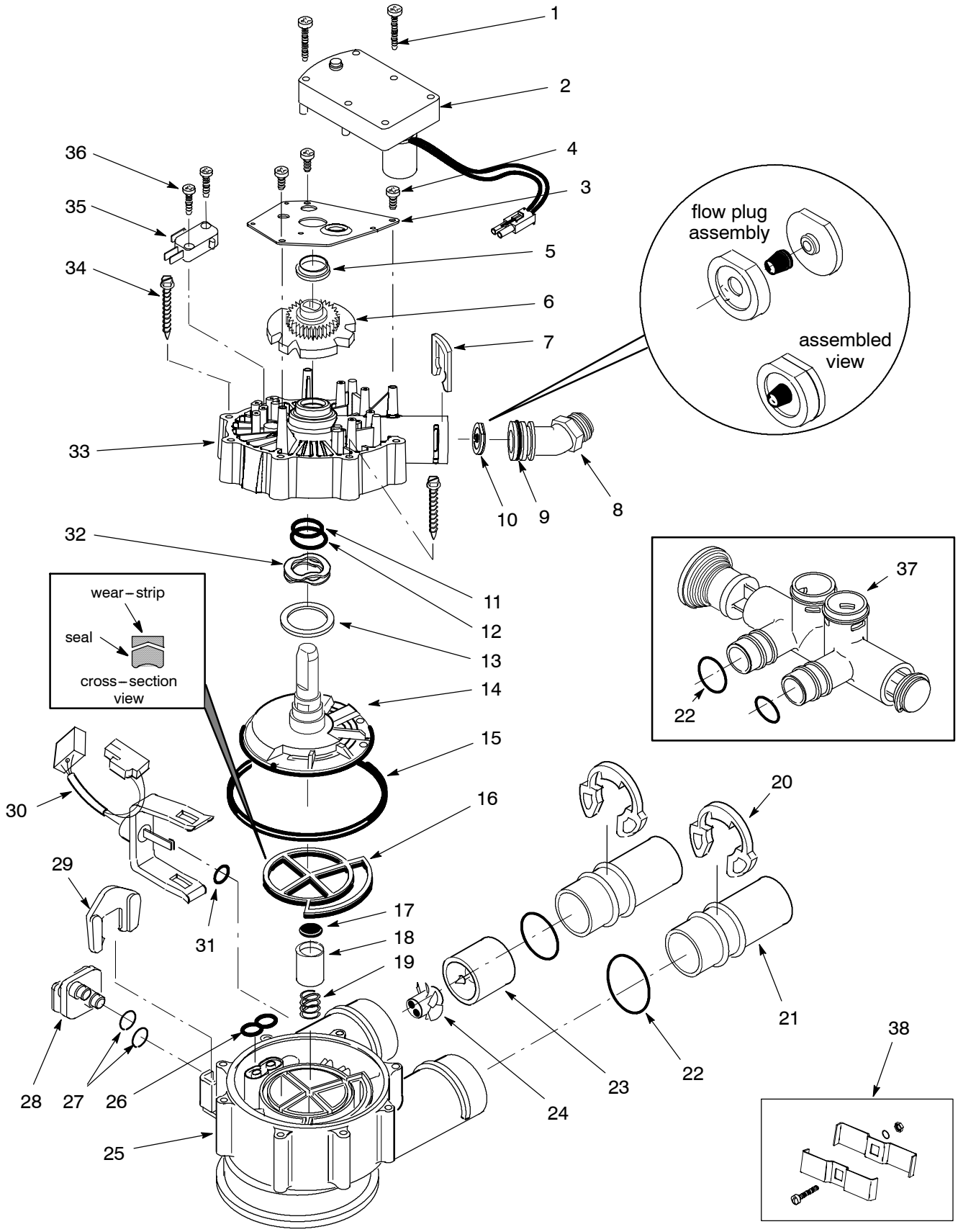
WARNING: FILTER TANK CONTAINS AIR. TO RELIEVE PRESSURE, PUT BYPASS VALVE IN BYPASS AND ADVANCE FILTER VALVE TO BACKWASH BEFORE DISASSEMBLY.

REPAIR PARTS

KEY NO.	PART NO.	DESCRIPTION
1	7275907	Transformer, 24V – 10VA
2	7260554	Top Cover (order following decal)
–	7285279	Decal
3	7286699	Rep'l PWA
4	7189449	Bottom Cover
5	7088033	Clamp Retainer (Clip), 4 req'd
6	7176292	Clamp Section, 4 req'd
7	7223316	Rep'l Distributor, bottom
8	7223324	Resin Tank, 9" dia. x 60"
9	0509957	Birm Pkd
10	7124415	Quartz
11	7226039	Tank Base
12	7170254	O–ring, 13/16 I.D. x 1–1/16 O.D.
13	7170296	O–ring, 2–7/8 I.D. x 3–1/4 O.D.

KEY NO.	PART NO.	DESCRIPTION
14	7272030	Adaptor Asm (includes Key Nos. 15 & 21 qty of 2) ■
15	7190628	Check Valve ■
16	7170270	O–ring, 2–3/4 I.D. x 3 O.D.
17	7168312	O–ring, 63/64 I.D. x 1–1/4 O.D. ■
18	7293345	Float Asm ■
19	7161784	Tubing, 1/4" x 100 ft.
20	7199486	Insert, Restrictor ■
21	7171666	Connector, 3 req'd ■
22	7288081	Air Pump, 115 V
23	7276050	Relay Box
■	7272438	Adaptor Kit

REPAIR PARTS



REPAIR PARTS

KEY NO.	PART NO.	DESCRIPTION
1	7224087	Screw, #6-20 x 7/8 (2 req.)
2	7286039	Motor (incl. 2 ea. of Key No. 1)
3	7231393	Motor Plate
4	0900857	Screw, #6-20 x 3/8 (3 req.)
5	7171250	Bearing
6	7283489	Cam and Gear
7	7169180	Clip (Drain)
8	7172793	Drain Hose Adaptor
9	7170288	O-ring, 15/16 x 1–3/16
10	7178189	Flow Plug, 5 gpm
11	7170327	O-ring, 5/8 x 13/16 ■
12	7173024	O-ring, 1–1/8 x 1–1/2 ■
13	7174313	Bearing, Wave Washer
14	7185500	Rotor & Disc
15	7173032	O-ring, 4–1/2 x 4–7/8 ■
16	7171179	Rotor Seal ■
–	7171331	Wear Strip ■
17	7172989	Seal ■
18	7171187	Plug (Drain Seal)
19	7129889	Spring
20	7089306	Clip (2 req.)
21	7077642	Copper Tube, 1” (2 req.)
22	7170262	O–ring, 1–1/8 x 1–3/8 (4 req.)

KEY NO.	PART NO.	DESCRIPTION
23	7094898	Turbine Support
24	7101548	Turbine
25	7171145	Valve Body
26	7195482	Seal ■
27	7170319	O–ring, 1/4 x 3/8 (2 req.)
28	7100940	Plug
29	7081201	Retainer
30	7276084	Wire Harness & Sensor Housing
31	0900060	O–ring
32	7175199	Wave Washer
33	7171161	Valve Cover
34	7172997	Screw, #10 x 2–5/8 (8 req.)
35	7145186	Switch
36	7140738	Screw, #4-24 x 3/4 (2 req.)
37	7214383	Bypass Valve (Includes following parts) ❖
–	7172882	Stem
–	7173016	O–ring, 1.109 I.D. x 1.387 O.D. (4 req.)
–	7175238	C–ring
38	7248706	Ground Clamp
■	7185487	Seal Kit (incl. Key Nos. 11, 12, 15, 16, 17 and 26)

❖ Optional part.